AMENDMENT AND RESPONSE

In response to the most recent Office Action in this case mailed March [illegible] 2003, the Applicant, acting through his attorney, requests amendment of the above referenced application as follows:

In the Claims:

Please amend claims 59 and 61, and add new claims 68 and 69, as indicated below:

Claims 1-23. See issued patent.

24–27. (Cancelled).

28. A method, comprising:

generating a first current that changes with temperature according to a first polarity;

generating a second current that changes with temperature according to a second polarity;

combining the first and second currents to generate a reference current; and

comparing the reference current to a third current that is dependent on a power-supply voltage.

29. The method of claim 28 wherein:

the first current changes with temperature according to a positive polarity; and

the second current changes with temperature according to a negative polarity.

30. The method of claim 28 wherein:

the first current is proportional to temperature; and

the second current is inversely proportional to temperature

31. The method of claim 28 wherein:

the first current increases as temperature increases and decreases as temperature decreases; and

the second current decreases as temperature increases and increases as temperature decreases.

32. The method of claim 28 wherein combining the first and second currents comprises summing the first and second currents.

33. The method of claim 28 wherein combining the first and second currents comprises sinking the first and second currents from a node.

34. The method of claim 28 wherein combining the first and second currents comprises sourcing the first and second currents to a node.

35–39. (Cancelled)

40. A method, comprising:

generating a first current that increases as temperature increases and that decreases as temperature decreases;

generating a second current that decreases as temperature increases and that increases as temperature decreases;

generating a third current that is dependent on a first voltage; and

combining the first, second, and third currents at a node to generate a second voltage on the node.

41. The method of claim 40 wherein combining the currents comprises:

sinking the first and second currents from the node; and

sourcing the third current to the node.

42. The method of claim 40 wherein:

the first current is related to a thermal voltage; and

the second current is related to a voltage across a forward-biased p-n junction.

43. The method of claim 40 wherein:

the first current is related to a thermal voltage; and

the second current is related to a base-emitter voltage of a bipolar transistor.

44. The method of claim 40 wherein the second current is related to the natural logarithm of a current through a bipolar transistor.

45. A method, comprising:

generating a first current that is related to temperature according to a first polarity;

generating a second current that is related to temperature according to a second polarity;

combining the first and second currents into a reference current;

generating a third current that is dependent on a first voltage; and

comparing the third current to the reference current.

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46. The method of claim 45 wherein:

the first current is related to a thermal voltage;

the second current is related to a voltage across a forward-biased p-n junction; and

the third current is dependent on a power-supply voltage.

47. The method of claim 45 wherein:

combining the first and second currents comprises sinking the first and second currents from a node; and

comparing the third current to the reference current comprises,

sourcing the third current to the node, and

comparing a second voltage on the node to a reference voltage.

48. A method, comprising:

generating a first current that is proportional to a threshold voltage of a field-effect transistor;

generating a second current that is proportional to a difference between a supply voltage and a threshold voltage of a second field-effect transistor;

generating a third current that is proportional to a base-emitter voltage of a first bipolar transistor;

generating a fourth current that is proportional to absolute temperature; and

driving a node with the first, second, third, and fourth currents.

49. The method of claim 48 wherein driving the node comprises:

sourcing the first and second currents to the node; and

sinking the third and fourth currents from the node.

50. The method of claim 48, further comprising comparing a voltage on the node with a reference voltage.

51. The method of claim 48 wherein the first field-effect transistor is matched to the second field-effect transistor.

52. The method of claim 48 wherein the threshold voltage of the first field-effect transistor is equal or approximately equal to the threshold voltage of the second field-effect transistor.

53. A method, comprising:

generating a first current that equals a product of a first constant and a threshold voltage of a first field-effect transistor;

generating a second current that equals a product of a second constant and a difference between a supply voltage and a threshold voltage of a second field-effect transistor;

generating a third current that equals a product of a third constant and a base-emitter voltage of a bipolar transistor;

generating a fourth current that equals a product of a fourth constant and a thermal voltage; and

driving a node with the first, second, third, and fourth currents.

54. The method of claim 53 wherein the first constant equals the second constant.

55. The method of claim 53 wherein driving the node comprises:

sourcing the first and second currents to the node; and

sinking the third and fourth currents from the node.

56. A method, comprising:

generating a first current that changes with temperature according to a first polarity;

generating a second current that changes with temperature according to a second polarity;

combining the first and second currents to generate a reference current; and

comparing the reference current to a third current that is proportional to a power-supply voltage.

57. The method of claim 28 wherein comparing the reference current comprises summing the reference current and the third current at a node.

58. The method of claim 28 wherein comparing the reference current comprises:

sinking the reference current from a node; and

sourcing the third current to the node.

59. A method, comprising:

sinking from a node a reference current having a first temperature coefficient;

sourcing to the node a current having approximately the first temperature coefficient and being related to a power-supply voltage; and

comparing the reference current to the supply-related current.

60. The method of claim 59 wherein the reference current is independent of the power-supply voltage.

61. The method of claim 59 wherein comparing the reference current comprises summing the reference current and the supply-related current at the node to generate a voltage.

62. A method, comprising:

generating a reference current having a first temperature coefficient;

comparing the reference current to a supply-related current that is related to a power-supply voltage and that has or has approximately the first temperature coefficient;

wherein comparing the reference current comprises summing the reference current and the supply-related current at a node to generate a voltage;

connecting the power-supply voltage to a load if the voltage is greater than a predetermined level; and

connecting a secondary supply to the load if the voltage is less than the predetermined level.

63. A method, comprising:

generating a first current that is related to temperature according to a first polarity;

generating a second current that is related to temperature according to a second polarity;

combining the first and second currents into a reference current;

generating a third current that is related to temperature according to the first polarity;

generating a fourth current that is related to a supply voltage and that is related to temperature according to the second polarity;

combining the third and fourth currents into a supply-related current; and

comparing the reference current to the supply-related current.

64. The method of claim 63 wherein the [illegible] supply voltage.

65. The method of claim 63 wherein the supply-related current is proportional to the supply voltage.

66. The method of claim 63 wherein:

the first and third currents are inversely proportional to temperature; and

the second and fourth currents are proportional to temperature.

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67. The direct current sum bandgap voltage comparator of claim 24 wherein $K_4 = K_1$.

68. A method, comprising:

sinking from a node a reference current having a first temperature coefficient;

sourcing to the node a current that is related to a power-supply voltage and that has approximately the first temperature coefficient; and

neither sourcing nor sinking from the node a current other than the reference and supply-related currents.

69. A method comprising:

sinking from a comparison node a reference current having a first temperature coefficient;

sourcing to the comparison node a current that is related to a power-supply voltage and that has approximately the first temperature coefficient; and

comparing a voltage on the comparison node to a reference voltage.